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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/967,072

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Jerome R. Bellegarda

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12/02/2004

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EXAMINER

SKED, MATTHEW J

ART UNIT

PAPER NUMBER

2655

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/967,072

Applicant(s)

BELLEGARDA, JEROME R.

Examiner

Matthew J Sked

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 10-13, 21-24, 32-36, 44-47, 55 and 56 is/are rejected.
- 7) ☒ Claim(s) 3-9, 14-20, 25-31, 37-43 and 48-54 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because Fig. 1-10 are sloppy. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

The objection to the drawings will not be held in abeyance.

### ***Information Disclosure Statement***

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. "Latent Semantic Indexing, A Probabilistic Analysis" mentioned in the specification and the U.S. Patent references submitted on the diskette were not listed on an Information Disclosure Statement.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 10-13, 21-24, 32-36, 44-47, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz et al. (U.S. Pat. 6,356,864) in view of Hazlehurst et al. (U.S. Pat. 6,289,353).

As per claims 1, 12, 23, 35 and 46, Foltz teaches a method, apparatus, system and computer-readable medium for generating a speech recognition database comprising:

generating a latent semantic analysis space from a training corpus of documents representative of a language (uses LSA to analyze representative text to thereafter evaluate sample text, col. 2, lines 20-24 and LSA creates a semantic-space matrix for this evaluation, col. 10, lines 47-51); and

receiving a new document (ungraded sample text, col. 10, lines 63-64).

Foltz does not teach that the new document represents a change in the language and adapting the LSA space to reflect this change in the language.

Hazlehurst teaches the new document represents a change in the language and adapting an information space to reflect this change in the language (evolves the vector space based upon new documents, col. 5, lines 40-48).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Foltz so that the new document represents a change in the language and adapting the LSA information space to reflect this change in the language as taught by Hazlehurst because, as suggested by Hazlehurst (col. 1, lines 55-59), it would provide more relevant document retrieval over time.

5. As per claim 34, Foltz teaches an apparatus for recognizing speech comprising:

means for recognizing an audio input as a new document (speech-to-text conversion for input, col. 10, lines 2-6);

means for processing the new document using latent semantic analysis (the new document vector is computed using the trained matrices which were found through LSA, col. 11, lines 30-40); and

means, coupled to the means for processing, for semantically inferring from a vector representation of the new document which of a plurality of known words and known documents correlate to the new document (determines the degree of similarity between the ungraded sample input text and the standard text by comparing their vector representations, col. 11, lines 41-45).

Foltz does not teach processing the new document using latent semantic adaptation.

Hazlehurst teaches the new document represents a change in the language and adapting an information space to reflect this change in the language (evolves the vector space based upon new documents, col. 5, lines 40-48).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Foltz to process the new document by adapting the LSA information space to reflect this change in the language as taught by Hazlehurst because, as suggested by Hazlehurst (col. 1, lines 55-59), it would provide more relevant document retrieval over time.

6. As per claims 2, 13, 24, 36 and 47, Foltz and Hazlehurst do not teach adapting the LSA space to reflect the change in the language comprises transforming the LSA

space to take into account the new document's influence on the LSA space without re-computing the LSA space.

However, the Examiner takes Official Notice that transforming vector spaces rather than re-computing them is well known in the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Foltz and Hazlehurst to transform the LSA space to take into account the new document's influence on the LSA space without re-computing the LSA space because LSA is computationally expensive hence it would speed up processing by performing this calculation a minimum times as possible.

7. As per claims 10, 21, 32, 44 and 55, Foltz does not teach the change in language is a change in the language's domain.

Hazlehurst teaches the change in language is a change in the language's domain (vector spaces for AIDS and cancer concepts, col. 5, lines 52-60).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Foltz so that the change in language is a change in the language's domain as taught by Hazlehurst because it allow better recovery of documents when the system is used for multiple domains.

8. As per claims 11, 22, 33, 45 and 56, Foltz and Hazlehurst do not teach the change in the language is the language's style.

However, the Examiner takes Official Notice that user's speak using different language styles. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Foltz and Hazlehurst so that the change

in the language is the language's style because it allows for better recovery of documents when used by speakers who use different language styles.

***Allowable Subject Matter***

9. Claims 3-9, 14-20, 25-31, 37-43, and 48-54 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As per claims 3, 14, 25, 37, and 48, Foltz teaches:

obtaining a training document vector that characterizes a semantic position of the training document within the LSA space (vector representation of standard text, col. 10, lines 52-62); and

computing a new document vector that characterizes a semantic position of the new document within the LSA space (computation of pseudo-object for the ungraded sample text, col. 11, lines 1-7).

However, the prior art does not teach nor fairly suggest deriving a document vector transformation matrix and applying this document vector transformation matrix to the training document vector to shift a position of each document vector in the LSA space, where the shift in the position reflects the change in the language.

Claims 4-9, 15-20, 26-31, 38-43, and 49-54 would then be allowable because they further limit the subject matter in their parent claims.

**Conclusion**

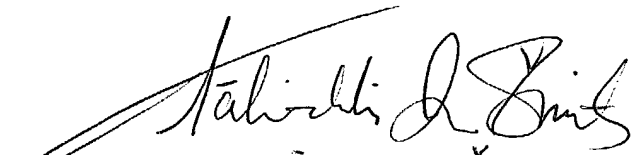
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Deerwater et al. (U.S. Pat. 4,839,853), Tokuda et al. (U.S. Pat. 6,654,740), Bellegarda et al. (U.S. Pat. 6,208,971), and Bellegarda (U.S. Pat. 6,374,217) teach methods of using latent semantic analysis for information retrieval. Marchisio (U.S. Pat. 6,757,646) and Marchisio (U.S. Pat. 6,510,406) teach changing the vector space for better information retrieval.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (703) 305-8663. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on (703) 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MS  
11/29/04

  
TALIVALDIS IVARS SMITS  
PRIMARY EXAMINER